

Remarks/Arguments

This is a complete response to the Office Action mailed 05/04/2005 in which claims 1-11 were rejected. Claims 1, 7, 10, and 11 have been amended and new claims 12-13 are submitted for examination. Claims 1-13 are pending. Reconsideration and reexamination of the subject application are respectfully requested.

Drawings

The drawings were objected to as violating 37 CFR 1.84(p)(5) for not mentioning the reference characters 12, 22, 14, 24, and 26 from Fig.4 in the description. The rule cited prohibits the appearance of reference characters in the drawings that are not mentioned in the description. However, the reference characters at issue are described fully in the specification on pages 2 through 4 in connection with Fig. 1. Please further note that the specification provides that, "Throughout the several views, like elements are referenced using like references." (Pg. 2, line 18) Here, the elements associated with reference characters 12, 22, 14, 24, and 26 are the same in both Fig. 1 and Fig. 4, and, as explained above, those characters are fully described on pages 2 through 4 of the specification. Applicant submits that the drawings are compliant with 37 CFR 1.84(p)(5) and the objection is requested to be withdrawn.

Claim Objections

Objections were raised with regard to claims 1 and 7 because the word *fluorescence* was misspelled. Claims 1 and 7 have been amended to correct the spelling of that word. Also, in accordance with the examiner's direction, the applicant amended the numbering of claims 10 and 11 that were incorrectly numbered as claims 11 and 12, respectively. These amendments should overcome the objections of claims 1, 7, 11, and 12.

Claim Rejections - 35 USC § 102

Claims 1, 3-7, and 9-11 were rejected under 35 U.S.C. 102(b) as being anticipated by US 5530711 (hereinafter '711). Applicant respectfully traverses the rejections. Claims 1 and 7 each have been amended to further recite, *inter alia*, that the laser diode system

operates in a *non-steady-state mode*. Support for the amendments is found within the specification at page 4, line 12 through page 5, line 14. Given that '711 does not teach or suggest this limitation, '711 does not provide a valid 35 USC 102(b) reference against claims 1 and 7, and the rejection is requested to be withdrawn.

Claims 3-6 and 9-11 depend from and incorporate all of the limitations of amended claims 1 and 7, respectively. Given that claims must be considered as a whole, *each* of claim combinations 1/3, 1/3/4, 1/5, 1/6, 7/9, 7/9/10, and 7/11 recite that the laser diode system operates in a *non-steady-state-mode*. Since '711 does not teach this further limitation, '711 does not provide a valid 35 USC 102(b) reference against claims 3-6 and 9-11. Therefore, the rejection is requested to be withdrawn.

New independent claims 12 and 13 are presented for examination and each recite an optical pump signal that is a sequence of optical pulses each having a pulse width t wherein $0.950 \leq 1 - e^{-t/\tau_f} \leq 0.993$, and τ_f represents the fluorescence lifetime of the laser dye. Support for new claims 12 and 13 is found in the specification at page 4, line 12 through page 5, line 7. The '711 patent does not teach a sequence of optical pulses having a pulse width constrained by the above-referenced equation, and therefore, would not provide a 35 USC 102(b) reference with regard to new claims 12 and 13.

Claim Rejections – USC § 103

Claims 2 and 8 were rejected under 35 U.S.C. 103(a) as being unpatentable over '711. Applicant respectfully traverses the rejection. Claim 2 depends from and incorporates all of the limitations of amended independent claims 1 and 7 respectively, as described above with regard to operating the laser diode system in a *non-steady-state mode*. Based on the '711 patent, the rejection fails to establish a *prima facie* case of obviousness as against claims 2 and 8 because '711 neither teaches nor suggests the operation of a laser diode system in a *non-steady-state-mode*, as recited in *claim combinations* 1/2 and 7/8.

Moreover '711 teaches away from the inventive combinations defined in claims 2 and 8. At column 20, lines 22-24, '711 states:

*Since the optical damage threshold is power dependent, delivering a fixed amount of energy per pulse over a **longer pulse** width avoids the potential of optical damage. [Emphasis added.]*

In contrast to '711, claims 2 and 8 incorporate limitations from amended claims 1 and 7 respectively which requires that the laser diode system operate in a **non-steady-state-mode**, where the excitation pulses are **limited** to each having a pulse width of about $n\tau_f$, where τ_f represents a fluorescence lifetime of said laser dye, and $3 \leq n \leq 25$. As previously stated, '711 neither teaches nor suggests operating a laser diode system in a non-steady-state mode.

The rejection also provides:

It is further stated that the lifetime of the laser gain element (being pumped) places an upper limit on the modulation rate that can be achieved (col. 19 lines 57-59, meaning that lower modulation rates may be used, falling in the 1 KHz to 1 Mhz limit, and that the restriction is specifically on the upper limit of the pumped material).

As a result of the amendments of claims 1 and 7, claim combinations 1/2 and 7/8 are directed to a laser diode system that generates a sequence of optical pulses at a **repetition rate** in the range of about 1 KHz to 1 Mhz, where each pulse has a **pulse width** resulting in the laser diode system operating in a **non-steady-state mode**.

MPEP §2141.02 states: *In determining the differences between the prior art and the claims, the question under 35 U.S.C. 103 is not whether the differences themselves would have been obvious, but whether the invention as a whole would have been obvious.*

Given that claims must be examined as a whole, it is clear that '711 neither teaches nor suggests **all** of the limitations in claim combinations 1/2 and 7/8. Therefore, the 35 USC 103 rejections of claims 2 and 8 are requested to be withdrawn. Should the rejection continue to be asserted, the examiner is requested to:

- i) delineate by column and line number just exactly where in the prior art of record there is the teaching or suggestion of operating a laser diode system in a non-steady-state-mode; and
- ii) show where in '711 where there is a teaching or suggestion that defines a sequence of pulses having pulse widths constrained by the limitations recited in amended claims 1 and 7 that are incorporated into claims 2 and 8.

Conclusion

Applicant respectfully requests that a Notice of Allowance be issued as to claims 1-13.

Respectfully submitted,



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